



SEQUENCE LISTING

(1) GENERAL INFORMATION

- (i) APPLICANT: Peterson, et al.
- (ii) TITLE OF THE INVENTION: METHODS FOR GENERATING AND SCREENING NOVEL METABOLIC PATHWAYS
- (iii) NUMBER OF SEQUENCES: 51
- (iv) CORRESPONDENCE ADDRESS:
  - (A) ADDRESSEE: Pennie & Edmonds LLP
  - (B) STREET: 1155 Avenue of the Americas
  - (C) CITY: New York
  - (D) STATE: NY
  - (E) COUNTRY: USA
  - (F) ZIP: 10036/2711
- (v) COMPUTER READABLE FORM:
  - (A) MEDIUM TYPE: Diskette
  - (B) COMPUTER: IBM Compatible
  - (C) OPERATING SYSTEM: DOS
  - (D) SOFTWARE: FastSEQ Version 2.0
- (vi) CURRENT APPLICATION DATA:
  - (A) APPLICATION NUMBER: CPA of 08/986,186
  - (B) FILING DATE: 05-DEC-1997
  - (C) CLASSIFICATION:
- (viii) ATTORNEY/AGENT INFORMATION:
  - (A) NAME: Coruzzi, Laura A
  - (B) REGISTRATION NUMBER: 30,742
  - (C) REFERENCE/DOCKET NUMBER: 8757-009
- (ix) TELECOMMUNICATION INFORMATION:
  - (A) TELEPHONE: 212-790-9090
  - (B) TELEFAX: 212-869-9741
  - (C) TELEX: 66141 PENNIE

(2) INFORMATION FOR SEQ ID NO:1:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 23 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: DNA
- (ix) FEATURE:
  - (A) NAME/KEY: Oligonucleotide "Bead-link-5"
  - (B) LOCATION: 1...23
  - (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Biotin at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

GCCGACCATT TAAATCGGTT AAT

23

(2) INFORMATION FOR SEQ ID NO:2:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 21 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Oligonucleotide "Bead-link-3"
- (B) LOCATION: 1...21
- (D) OTHER INFORMATION:

(A) NAME/KEY: Other

(B) LOCATION: 1

(D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

TAACCGATTT AAATGGTCGG C

21

(2) INFORMATION FOR SEQ ID NO:3:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 44 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Annealed beadlink oligonucleotide
- (B) LOCATION: 1...44
- (D) OTHER INFORMATION:

(A) NAME/KEY: Other

(B) LOCATION: 8...15, 31...38

(D) OTHER INFORMATION: SmaI restriction  
endonuclease sites

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

GCCGACCATT TAAATCGGTT AATCGGCTGG TAAATTTAGC CAAT

44

(2) INFORMATION FOR SEQ ID NO:4:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 12 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: BstXI site
- (B) LOCATION: 1...12
- (D) OTHER INFORMATION:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

CCACCTAACT GG

12

(2) INFORMATION FOR SEQ ID NO:5:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Promoter for cDNA and gDNA inserts
- (B) LOCATION: 1...20
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 10...11
- (D) OTHER INFORMATION: Promoter site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

GAGTAGATCT CTCGAGCGGC

20

(2) INFORMATION FOR SEQ ID NO:6:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Promoter for cDNA and gDNA inserts
- (B) LOCATION: 1...20
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other

- (B) LOCATION: 10...11
- (D) OTHER INFORMATION: Promoter site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

GCCGCTCGAG AGATCTACTC

20

(2) INFORMATION FOR SEQ ID NO:7:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 6 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Promoter for cDNA and gDNA inserts
- (B) LOCATION: 1...6
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 5...6
- (D) OTHER INFORMATION: Promoter site

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

GATCTC

6

(2) INFORMATION FOR SEQ ID NO:8:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 6 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Promoter for cDNA and gDNA inserts
- (B) LOCATION: 1...6
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 5...6
- (D) OTHER INFORMATION: Promoter site

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

TCGAGA

6

(2) INFORMATION FOR SEQ ID NO:9:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 8 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Promoter for cDNA and gDNA inserts
- (B) LOCATION: 1...8
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 5...6
- (D) OTHER INFORMATION: Promoter site

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

GATCTCTC

8

(2) INFORMATION FOR SEQ ID NO:10:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Terminator for cDNA inserts
- (B) LOCATION: 1...20
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 10...11
- (D) OTHER INFORMATION: Terminator site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

GATCCCCGGG GGATCCCCGC

20

(2) INFORMATION FOR SEQ ID NO:11:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Terminator for cDNA inserts
- (B) LOCATION: 1...20
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 10...11
- (D) OTHER INFORMATION: Terminator site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

GCCGGGATCC CCCGGGGATC

20

(2) INFORMATION FOR SEQ ID NO:12:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 15 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Terminator for cDNA inserts
- (B) LOCATION: 1...15
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 5...6
- (D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

## (2) INFORMATION FOR SEQ ID NO:13:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 11 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: DNA

## (ix) FEATURE:

- (A) NAME/KEY: Terminator for cDNA inserts
- (B) LOCATION: 1...11
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 10...11
- (D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

GCCGGGGATCC C

11

## (2) INFORMATION FOR SEQ ID NO:14:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 13 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: DNA

## (ix) FEATURE:

- (A) NAME/KEY: Terminator for cDNA inserts
- (B) LOCATION: 1...13
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 10...11
- (D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

GCCGGGATCC CCC

13

(2) INFORMATION FOR SEQ ID NO:15:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Terminator
- (B) LOCATION: 1...20
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 10...11
- (D) OTHER INFORMATION: Terminator site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

CGGCCTCGAG GGATCCCGGC

20

(2) INFORMATION FOR SEQ ID NO:16:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Terminator
- (B) LOCATION: 1...20
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 10...11
- (D) OTHER INFORMATION: Terminator site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

GCCGGGATCC CTCGAGGCCG

20

(2) INFORMATION FOR SEQ ID NO:17:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 15 base pairs



- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Terminator
- (B) LOCATION: 1...15
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 5...6
- (D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

TCGAGGGATC CCGGC

15

(2) INFORMATION FOR SEQ ID NO:18:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 11 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Terminator
- (B) LOCATION: 1...11
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 10...11
- (D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

GCCGGGATCC C

11

(2) INFORMATION FOR SEQ ID NO:19:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 13 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Terminator
- (B) LOCATION: 1...13
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 10...11
- (D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

GCCGGGATCC CTC

13

(2) INFORMATION FOR SEQ ID NO:20:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 7 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 5...6
- (D) OTHER INFORMATION: cDNA inserts

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

GATCCGC

7

(2) INFORMATION FOR SEQ ID NO:21:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 9 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single

- (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: DNA
- (ix) FEATURE:
  - (A) NAME/KEY: Other
  - (B) LOCATION: 6...7
  - (D) OTHER INFORMATION: cDNA inserts
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

GGCCGCGGA

9

- (2) INFORMATION FOR SEQ ID NO:22:
- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 9 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: DNA
- (ix) FEATURE:
  - (A) NAME/KEY: Other
  - (B) LOCATION: 5...6
  - (D) OTHER INFORMATION: Methylated inserts
- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

GATCCGCGG

9

- (2) INFORMATION FOR SEQ ID NO:23:
- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 32 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: DNA
- (ix) FEATURE:
  - (A) NAME/KEY: cDNA gene cassettes
  - (B) LOCATION: 1...32
  - (D) OTHER INFORMATION:
- (A) NAME/KEY: Other
- (B) LOCATION: 5...6
- (D) OTHER INFORMATION: Promoter site

- (A) NAME/KEY: Other
- (B) LOCATION: 13...14
- (D) OTHER INFORMATION: Methylated inserts

- (A) NAME/KEY: Other
- (B) LOCATION: 22...23
- (D) OTHER INFORMATION: Terminator site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

GATCTCTCGA TCCGCGGCCG GGGGATCCCG GC

32

(2) INFORMATION FOR SEQ ID NO:24:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 28 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: cDNA gene cassettes
- (B) LOCATION: 1...28
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 10...11
- (D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 19...20
- (D) OTHER INFORMATION: Methylated inserts

- (A) NAME/KEY: Other
- (B) LOCATION: 27...28
- (D) OTHER INFORMATION: Promoter site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:24:

GCCGGGATCC CCCGGCCGCG GATCGAGA

28

(2) INFORMATION FOR SEQ ID NO:25:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 6 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Gene fragments
- (B) LOCATION: 1...6
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 5...6
- (D) OTHER INFORMATION: gDNA inserts

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

GATCCG

6

(2) INFORMATION FOR SEQ ID NO:26:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 6 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Gene fragments
- (B) LOCATION: 1...6
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 5...6
- (D) OTHER INFORMATION: gDNA inserts

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

GATCCG

6

(2) INFORMATION FOR SEQ ID NO:27:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 8 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA  
(ix) FEATURE:

(A) NAME/KEY: Gene fragments  
(B) LOCATION: 1...8  
(D) OTHER INFORMATION:

(A) NAME/KEY: Other  
(B) LOCATION: 5...6  
(D) OTHER INFORMATION: Methylated inserts

(A) NAME/KEY: Other  
(B) LOCATION: 1  
(D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

GATCCGGA

8

(2) INFORMATION FOR SEQ ID NO:28:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 31 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA  
(ix) FEATURE:

(A) NAME/KEY: cDNA gene cassettes  
(B) LOCATION: 1...31  
(D) OTHER INFORMATION:

(A) NAME/KEY: Other  
(B) LOCATION: 5...6  
(D) OTHER INFORMATION: Promotor site

(A) NAME/KEY: Other  
(B) LOCATION: 13...14  
(D) OTHER INFORMATION: Methylated inserts

(A) NAME/KEY: Other  
(B) LOCATION: 21...22  
(D) OTHER INFORMATION: Terminator site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:28:

GATCTCTCGA TCCGGATCGA GGGATCCCGG C

31

(2) INFORMATION FOR SEQ ID NO:29:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 27 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: cDNA gene cassettes
- (B) LOCATION: 1...27
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 10...11
- (D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 18...19
- (D) OTHER INFORMATION: Methylated inserts

- (A) NAME/KEY: Other
- (B) LOCATION: 26...27
- (D) OTHER INFORMATION: Promoter site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

GCCGGGATCC CTCGATCCGG ATCGAGA

27

(2) INFORMATION FOR SEQ ID NO:30:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 33 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 6...7
- (D) OTHER INFORMATION: Promoter site

- (A) NAME/KEY: Other
- (B) LOCATION: 14...15
- (D) OTHER INFORMATION: Methylated inserts

- (A) NAME/KEY: Other
- (B) LOCATION: 23...24
- (D) OTHER INFORMATION: Terminator site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

GGATCTCTCG ATCCGCGGCC GGGGGATCCC GGC

33

(2) INFORMATION FOR SEQ ID NO:31:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 33 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 10...11
- (D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 19...20
- (D) OTHER INFORMATION: Methylated inserts

- (A) NAME/KEY: Other
- (B) LOCATION: 27...28
- (D) OTHER INFORMATION: Promoter site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:31:

GCCGGGATCC CCCGGCCGCG GATCGAGAGA TCC

33

(2) INFORMATION FOR SEQ ID NO:32:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 32 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 6...7
- (D) OTHER INFORMATION: Promoter site

- (A) NAME/KEY: Other
- (B) LOCATION: 14...15
- (D) OTHER INFORMATION: Methylated inserts

- (A) NAME/KEY: Other
- (B) LOCATION: 22...23
- (D) OTHER INFORMATION: Terminator site



(xi) SEQUENCE DESCRIPTION: SEQ ID NO:32:

GGATCTCTCG ATCCGGATCG AGGGATCCCG GC

32

(2) INFORMATION FOR SEQ ID NO:33:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 32 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 10...11
- (D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 18...19
- (D) OTHER INFORMATION: Methylated inserts

- (A) NAME/KEY: Other
- (B) LOCATION: 26...27
- (D) OTHER INFORMATION: Promoter site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:33:

GCCGGGATCC CTCGATCCGG ATCGAGAGAT CC

32

(2) INFORMATION FOR SEQ ID NO:34:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 23 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 6...7
- (D) OTHER INFORMATION: Promoter site

- (A) NAME/KEY: Other
- (B) LOCATION: 14...15
- (D) OTHER INFORMATION: Methylated inserts

- (A) NAME/KEY: Other

- (B) LOCATION: 22...23
- (D) OTHER INFORMATION: Terminator site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:34:

GGATCTCTCG ATCCGGATCG AGG

23

(2) INFORMATION FOR SEQ ID NO:35:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 27 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 5...6
- (D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 13...14
- (D) OTHER INFORMATION: Methylated inserts

- (A) NAME/KEY: Other
- (B) LOCATION: 21...22
- (D) OTHER INFORMATION: Promoter site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:35:

GATCCCTCGA TCCGGATCGA GAGATCC

27

(2) INFORMATION FOR SEQ ID NO:36:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 67 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 6...7, 28...29, 50...51
- (D) OTHER INFORMATION: Promoter site

- (A) NAME/KEY: Other
- (B) LOCATION: 14...15, 36...37, 58...59
- (D) OTHER INFORMATION: Methylated site

- (A) NAME/KEY: Other
- (B) LOCATION: 22...23, 44...45, 66...67
- (D) OTHER INFORMATION: Terminator site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:36:

GGATCTCTCG ATCCGGATCG AGGGATCTCT CGATCCGGAT CGAGGGATCT CTCGATCCGG	60
ATCGAGG	67

(2) INFORMATION FOR SEQ ID NO:37:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 71 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

- (A) NAME/KEY: Other
- (B) LOCATION: 5...6, 27...28, 49...50
- (D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 13...14, 35...36, 57...58
- (D) OTHER INFORMATION: Methylated inserts

- (A) NAME/KEY: Other
- (B) LOCATION: 21...22, 43...44, 65...66
- (D) OTHER INFORMATION: Promoter site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:37:

GATCCCTCGA TCCGGATCGA GAGATCCCTC GATCCGGATC GAGAGATCCC TCGATCCGGA	60
TCGAGAGATC C	71

(2) INFORMATION FOR SEQ ID NO:38:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 69 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

- (A) NAME/KEY: Other
- (B) LOCATION: 6...7, 28...29, 50...51
- (D) OTHER INFORMATION: Promoter site

- (A) NAME/KEY: Other
- (B) LOCATION: 14...15, 36...37, 58...59
- (D) OTHER INFORMATION: Methylated site

- (A) NAME/KEY: Other
- (B) LOCATION: 22...23, 44...45, 66...67
- (D) OTHER INFORMATION: Terminator site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:38:

GGATCTCTCG ATCCGGATCG AGGGATCTCT CGATCCGGAT CGAGGGATCT CTCGATCCGG	60
ATCGAGGGA	69

(2) INFORMATION FOR SEQ ID NO:39:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 13 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 5...6
- (D) OTHER INFORMATION: pDbLET Vector

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:39:

TCGAGCCAGC TAA	13
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(2) INFORMATION FOR SEQ ID NO:40:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 7 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 4...5
- (D) OTHER INFORMATION: pDbLET Vector

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:40:

## (2) INFORMATION FOR SEQ ID NO:41:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 60 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: DNA

## (ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 6...7, 28...29
- (D) OTHER INFORMATION: Promoter site

- (A) NAME/KEY: Other
- (B) LOCATION: 14...15, 36...37
- (D) OTHER INFORMATION: Methylated inserts

- (A) NAME/KEY: Other
- (B) LOCATION: 22...23, 44...45
- (D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 52...53
- (D) OTHER INFORMATION: pDbLET Vector

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:41:

GGATCTCTCG ATCCGGATCG AGGGATCTCT CGATCCGGAT CGAGGGATCG AGCCAGCTAA 60

## (2) INFORMATION FOR SEQ ID NO:42:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 56 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: DNA

## (ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

- (A) NAME/KEY: Other
- (B) LOCATION: 4...5
- (D) OTHER INFORMATION: pDbLET Vector

- (A) NAME/KEY: Other

(B) LOCATION: 12...13, 34...35  
(D) OTHER INFORMATION: Terminator site

(A) NAME/KEY: Other  
(B) LOCATION: 20...21, 42...43  
(D) OTHER INFORMATION: Methylated inserts

(A) NAME/KEY: Other  
(B) LOCATION: 28...29, 50...51  
(D) OTHER INFORMATION: Promoter site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:42:

CTGGCTCGAT CCCTCGATCC GGATCGAGAG ATCCCTCGAT CCGGATCGAG AGATCC

56

(2) INFORMATION FOR SEQ ID NO:43:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 62 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

(A) NAME/KEY: Other  
(B) LOCATION: 6...7, 29...30  
(D) OTHER INFORMATION: Promoter site

(A) NAME/KEY: Other  
(B) LOCATION: 14...15, 37...38  
(D) OTHER INFORMATION: Methylated inserts

(A) NAME/KEY: Other  
(B) LOCATION: 23...24, 46...47  
(D) OTHER INFORMATION: Terminator site

(A) NAME/KEY: Other  
(B) LOCATION: 54...55  
(D) OTHER INFORMATION: pDbLET Vector

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:43:

GGATCTCTCG ATCCGCGGCC GGGGGATCTC TCGATCCGCG GCCGGGGGAT CGAGCCAGCT  
AA

60

62

(2) INFORMATION FOR SEQ ID NO:44:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 58 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

(A) NAME/KEY: Other

(B) LOCATION: 1

(D) OTHER INFORMATION: Phosphate at nucleotide 1

(A) NAME/KEY: Other

(B) LOCATION: 4...5

(D) OTHER INFORMATION: pDbLET Vector

(A) NAME/KEY: Other

(B) LOCATION: 12...13, 35...36

(D) OTHER INFORMATION: Terminator site

(A) NAME/KEY: Other

(B) LOCATION: 21...22, 44...45

(D) OTHER INFORMATION: Methylated inserts

(A) NAME/KEY: Other

(B) LOCATION: 29...30, 52...53

(D) OTHER INFORMATION: Promoter site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:44:

CTGGCTCGAT CCCCCGGCCG CGGATCGAGA GATCCCCCGG CCGCGGATCG AGAGATCC

58

(2) INFORMATION FOR SEQ ID NO:45:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 68 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

(A) NAME/KEY: Other

(B) LOCATION: 1

(D) OTHER INFORMATION: Phosphate at nucleotide 1

(A) NAME/KEY: Other

(B) LOCATION: 14...15, 36...37

(D) OTHER INFORMATION: Promoter site

(A) NAME/KEY: Other

(B) LOCATION: 22...23, 44...45

(D) OTHER INFORMATION: Methylated inserts

(A) NAME/KEY: Other

(B) LOCATION: 30...31, 52...53

(D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 60...61
- (D) OTHER INFORMATION: pDbLET Vector

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:45:

GGTAGCGAGG ATCTCTCGAT CCGGATCGAG GGATCTCTCG ATCCGGATCG AGGGATCGAG	60
CCAGCTAA	68

(2) INFORMATION FOR SEQ ID NO:46:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 68 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

- (A) NAME/KEY: Other
- (B) LOCATION: 4...5
- (D) OTHER INFORMATION: pDbLET Vector

- (A) NAME/KEY: Other
- (B) LOCATION: 12...13, 34...35
- (D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 20...21, 42...43
- (D) OTHER INFORMATION: Methylated inserts

- (A) NAME/KEY: Other
- (B) LOCATION: 28...29, 50...51
- (D) OTHER INFORMATION: Promoter site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:46:

CTGGCTCGAT CCCTCGATCC GGATGGAGAG ATCCCTCGAT CCGGATGGAG AGATCCGGGC	60
TACCTTAG	68

(2) INFORMATION FOR SEQ ID NO:47:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 68 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear



(ii) MOLECULE TYPE: DNA

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

- (A) NAME/KEY: Other
- (B) LOCATION: 4...5
- (D) OTHER INFORMATION: pDbLET Vector

- (A) NAME/KEY: Other
- (B) LOCATION: 12...13, 34...35
- (D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 20...21, 42...43
- (D) OTHER INFORMATION: Methylated inserts

- (A) NAME/KEY: Other
- (B) LOCATION: 28...29, 50...51
- (D) OTHER INFORMATION: Promoter site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:47:

CTGGCTCGAT CCCTCGATCC GGATCGAGAG ATCCCTCGAT CCGGATGGAG AGATCCGGGC	60
TACCTTAG	68

(2) INFORMATION FOR SEQ ID NO:48:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 29 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Oligomer
- (B) LOCATION: 1...29
- (D) OTHER INFORMATION:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:48:

CCTAGCCATG GCCACCTAAC TGGGATCGC	29
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(2) INFORMATION FOR SEQ ID NO:49:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 37 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Oligomer
- (B) LOCATION: 1...37
- (D) OTHER INFORMATION:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:49:

GGCCGCGATC CCAGTTAGGT GGCCATGGCT AGGAGCT

37

(2) INFORMATION FOR SEQ ID NO:50:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 262 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(ix) FEATURE:

- (A) NAME/KEY: CXC-AMN20
- (B) LOCATION: 1...262
- (D) OTHER INFORMATION:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:50:

Asn	Ser	His	Phe	Ile	Ile	Thr	Thr	Gln	Gly	Val	Leu	Val	Phe	Asp	Ser
1				5					10					15	
Gly	Ser	Ser	Glu	His	Ile	Gly	Asn	Ala	Ile	Ile	Ala	Ala	Val	Lys	Arg
			20				25						30		
Val	Thr	Glu	Gln	Pro	Ile	Arg	Trp	Val	Val	Asn	Ser	His	Ser	His	Ala
		35				40						45			
Asp	His	Trp	Leu	Gly	Asn	Ala	Ala	Leu	Ala	Lys	Leu	Gly	Ala	Glu	Leu
	50				55					60					
Ile	Ser	Thr	Ser	Leu	Ser	Ala	Glu	Thr	Met	Lys	Ser	Asp	Gly	Pro	Val
65				70					75					80	
Asp	Val	Lys	Ala	Phe	Asn	Met	Thr	Lys	Gly	Ala	Thr	Gly	Glu	Ser	
			85					90					95		
Thr	Leu	Val	Ile	Pro	Thr	Ser	Ile	Ile	Leu	His	Gln	Gln	Thr	Arg	Thr
			100					105					110		
Phe	Gly	Asp	Thr	Glu	Val	Glu	Phe	Val	Phe	Ala	Asn	Asp	Gly	His	Ser
	115					120						125			
Pro	Gly	Asp	Val	Met	Leu	Trp	Leu	Pro	Lys	Gln	Arg	Ile	Leu	Ile	Gly
	130				135					140					
Gly	Asp	Val	Val	Asn	Ser	Asn	Phe	Met	Pro	Ile	Met	Thr	Pro	Arg	Gly
145				150					155					160	
Asn	Ile	Thr	Gln	Leu	Ile	Ser	Val	Leu	Lys	Glu	Val	Glu	Gln	Leu	Ser
			165					170						175	
Pro	Leu	Leu	Val	Leu	Thr	Gly	His	Gly	Glu	Asn	Thr	Ser	Val	Lys	Ser
			180			185							190		
Val	Ser	Arg	Asp	Ile	Gln	Phe	Leu	Thr	Tyr	Ala	Ser	Asn	Ala	Val	His
	195					200						205			
Glu	Ala	Leu	Val	Lys	Gly	Thr	Thr	Pro	Ala	Lys	Ile	Gln	Ala	Ser	Leu
	210					215						220			

Gln Ala Thr Leu Arg Thr Lys Phe Gly Lys Ala Tyr Gln Asp Phe Asp  
 225 230 235 240  
 Thr Ser Ile Ser Tyr Leu Leu Glu Met Met Ile Asp Lys Gln Arg Leu  
 245 250 255  
 Gln Phe Ser Pro Ile Thr  
 260

(2) INFORMATION FOR SEQ ID NO:51:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 297 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(ix) FEATURE:

- (A) NAME/KEY: Actinorhodin Dehydrase
- (B) LOCATION: 1...297
- (D) OTHER INFORMATION:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:51:

Met Thr Val Glu Val Arg Glu Val Ala Glu Gly Val Tyr Ala Tyr Glu  
 1 5 10 15  
 Gln Ala Pro Gly Gly Trp Cys Val Ser Asn Ala Gly Ile Val Val Gly  
 20 25 30  
 Gly Asp Gly Ala Leu Val Val Asp Thr Leu Ser Thr Ile Pro Arg Ala  
 35 40 45  
 Arg Arg Leu Ala Glu Trp Val Asp Lys Leu Ala Ala Gly Pro Gly Arg  
 50 55 60  
 Thr Val Val Asn Thr His Phe His Gly Asp His Ala Phe Gly Asn Gln  
 65 70 75 80  
 Val Phe Ala Pro Gly Thr Arg Ile Ile Ala His Glu Asp Met Arg Ser  
 85 90 95  
 Ala Met Val Thr Thr Gly Leu Ala Leu Thr Gly Leu Trp Pro Arg Val  
 100 105 110  
 Asp Trp Gly Glu Ile Glu Leu Arg Pro Pro Asn Val Thr Phe Arg Asp  
 115 120 125  
 Arg Leu Thr Leu His Val Gly Glu Arg Gln Val Glu Leu Thr Cys Val  
 130 135 140  
 Gly Pro Ala His Thr Asp His Asp Val Val Val Trp Leu Pro Glu Glu  
 145 150 155 160  
 Arg Val Leu Phe Ala Gly Asp Val Val Met Ser Gly Val Thr Pro Phe  
 165 170 175  
 Ala Leu Phe Gly Ser Val Ala Gly Thr Leu Ala Ala Leu Asp Arg Leu  
 180 185 190  
 Ala Glu Leu Glu Pro Glu Val Val Val Gly Gly His Gly Pro Val Ala  
 195 200 205  
 Gly Pro Glu Val Ile Asp Ala Asn Arg Asp Tyr Leu Arg Trp Val Gln  
 210 215 220  
 Arg Leu Ala Ala Asp Ala Val Asp Arg Arg Leu Thr Pro Leu Gln Ala  
 225 230 235 240  
 Ala Arg Arg Ala Asp Leu Gly Ala Phe Ala Gly Leu Leu Asp Ala Glu  
 245 250 255

Arg	Leu	Val	Ala	Asn	Leu	His	Arg	Ala	His	Glu	Glu	Leu	Leu	Gly	Gly
			260					265					270		
His	Val	Arg	Asp	Ala	Met	Glu	Ile	Phe	Ala	Glu	Leu	Val	Ala	Tyr	Asn
		275					280						285		
Gly	Gly	Gln	Leu	Pro	Thr	Cys	Leu	Ala							
	290						295								